

Oral Manifestations Related to Immunosuppression Degree in HIV-positive Children

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Oral manifestations often found in HIV-infected children are frequently the first clinical sign of the infection. This article aims to report the prevalence of oral manifestations in soft tissues and their relationship with the degree of immunosuppression in 80 HIV-infected patients (average age 6.30 ± 3.32 years old) at the IPPMG - UFRJ. Thirty children (38%) presented some type of oral lesion and the percentage of CD4 was lower than that found in lesion-free children ($p < 0.05$); 22.5% presented candidiasis, 17.5% gingivitis, 8.8% enlargement of parotids, 1.3% herpes simplex and 1.3% hairy leukoplakia. Of the 30 children with lesions, 70% showed severe immunosuppression, 23.3% moderate immunosuppression and in only 6.7% was immunosuppression absent. Oral manifestations were directly related to the degree of immunosuppression and such lesions can be considered as indicators of the progression of the HIV infection in children.

Key Words: acquired immunodeficiency syndrome, HIV infections, child, oral manifestations, immunosuppression.

INTRODUCTION

Acquired Immune Deficiency Syndrome (AIDS) was first reported in children in 1983 (1) and presented differences from infection in the adult: means of transmission, risk factors, methods of diagnosis and oral manifestations (2-4). According to the Brazilian Health Ministry (5), the number of cases reported until September 2000 was 196,016, of which 6,857 were children.

Oral manifestations frequently observed in HIV-positive patients may be classified according to etiologic factors: fungal, viral, bacterial and neoplastic infections. These lesions are often the first clinical symptoms of HIV infection and their diagnosis is an auxiliary method to raise early suspicion of AIDS (6).

The purpose of this article is to report the prevalence of oral soft tissue manifestations and their relationship with the degree of immunosuppression observed in HIV-infected children.

MATERIAL AND METHODS

Eighty HIV-infected children were examined between January and December of 1996, from a total of 120 patients at the Pediatric AIDS Outpatients Clinic (Instituto de Pediatria e Puericultura Martagão Gesteira (IPPMG) of the Universidade Federal do Rio de Janeiro (UFRJ)) who are treated by the dental team of the "AIDS in Pediatric Dentistry II" Project (F.O. - NESC - IPPMG/UFRJ). The 30 girls and 50 boys were aged from 2 to 12 years (6.3 ± 3.32 years). The criterion for inclusion was definitive diagnosis of HIV infection confirmed by 2 positive ELISA tests and 1 Western Blot. Signed consent for the participation of the children in the study was obtained from those responsible.

A record card was made for each child, providing data on anamnesis and oral examination. Prior to the examination, each child was given a toothbrush and fluoridated toothpaste to brush their teeth under the

supervision of an assistant, followed by application of 1.23% sodium fluoride (Vigodent, Rio de Janeiro, RJ, Brazil) with the toothbrush. A single trained examiner performed the examination, with the child lying down on a cot, using a buccal mirror, gauze and flashlight to illuminate the oral cavity. Bidigital palpation was performed on the cervical, submandibular and submental lymph nodes and the region of parotid, as well as inspection of the entire oral cavity. The criterion established by EEC-Clearinghouse (2) was used to diagnose the oral lesions.

The degree of immunosuppression was based on the CD4 percentage values obtained from each child's medical report in accordance with the Classification of Pediatric AIDS: severe, moderate or absent (7). CD4 counts closest to the oral exam, up to a 3-month interval, were used for each patient. Further medical information was obtained by reviewing the patients' medical records.

For statistical analysis, the chi-square test was used to compare percentages.

RESULTS

The average age of the 80 children was 6.30 ± 3.32 years old. Thirty patients (38%) presented some form of oral manifestation and had a lower CD4 percentage (9.33%) than those who presented no lesion (17.78%) ($p=0.0001$).

Candidiasis was the most prevalent oral manifestation found, affecting 18 (22.5%) children, followed by gingivitis (17.5%), parotid enlargement (8.8%), herpes simplex (1.3%) and hairy leukoplakia (1.3%). Some of these children presented two or more different types of this lesion.

The 30 children with oral manifestations were classified according to their degree of immunosuppression, 21 (70%) had severe immunosuppression and 7 (23.3%) moderate immunosuppression. Immunosuppression was absent in 2 children (6.7%). When the type of manifestation was compared to the immunosuppression degree, most of the children with candidiasis had severe immunosuppression. This same result was also found with gingivitis. Immunosuppression degree, CD4% and type of lesion

are shown in Table 1.

The most frequent type of candidiasis was pseudomembranous (72.2%). Some of these children presented 2 or more types of candidiasis. Table 2 shows the average percentages of CD4 in infected patients according to the type of candidiasis. There was no significant statistical difference.

DISCUSSION

Oral manifestations are common in children infected by HIV (8,9) and are associated with serious immunosuppression and AIDS. They are indicators for the infection with a predictive value of its progression (10). In this study 30% of the patients presented some oral lesion. Ramos-Gomez et al. (10), working with 60 HIV+ children, reported a 45% frequency of oral manifestations in soft tissue and, similar to this study the CD4 value in these children was statistically lower than in those with no oral lesion.

Candidiasis is the most common oral manifestation in HIV-infected children (6,11-13) and its prevalence ranges from 20% to 72% (14). In this study, candidiasis was present in 22.5% of the cases. Pseudomembranous candidiasis was the most common type, which is in agreement with Valdez et al. (8) and Santos et al. (13). Erythematous candidiasis and angular cheilitis were present in 44.4% of the cases of candidiasis, in accordance with the study by Valdez et al. (8).

A low value for CD4, characterizing the presence of immunosuppression, is a predisposing factor for the development of opportunistic infections. Similar to that reported by Chan et al. (14), Moniaci et al. (12) and Santos et al. (13), this study also verified a

Table 1. Oral manifestations, degree of immunosuppression and CD4 percentage in HIV+ children.

Oral manifestations	N	%CD4	Severe	Moderate	Absent
Candidiasis	18	5.3*	16 (88.9)**	2 (11.1)***	-
Gingivitis	14	9.3	10 (71.4)	3 (21.4)	1 (7.1)
Enlargement of parotids	7	17.8*	2 (28.6)**	4 (57.1)***	1 (14.3)
Herpes simplex	1	20.0	-	1(100)	-
Hairy leukoplakia	1	23.0	-	1 (100)	-

More than one oral manifestation was seen in some children.

* $p<0.001$; ** $p=0.005$; *** $p<0.05$

Table 2. Type of candidiasis and average CD4 percentage in HIV+ children.

Type of candidiasis	Frequency	Average CD4%
Pseudomembranous	13 (72.2%)	5.39
Erythematous	8 (44.4%)	5.69
Angular cheilitis	8 (44.4%)	7.50

Some children had 2 or more types of candidiasis.
p = 0.79

correlation between increased immunosuppression and the presence of candidiasis. Greenspan and Greenspan (3) also confirmed that the frequency of candidiasis increases as CD4 decreases, showing a relationship with the advance of this disease. Furthermore, the presence or absence of candidiasis in infected children may be directly related to the use of antiretroviral agents and the time of AIDS diagnosis (10). Data on medication use were not considered in this study.

Several reports in the specialized literature describe candidiasis and hairy leukoplakia as indicative of serious immunosuppression (14,15); however, in this study the only patient who presented hairy leukoplakia suffered from moderate immunosuppression. The presence of just one child with this lesion (1.3%) is in agreement with the prevalence of 0-2% reported by Ramos-Gomez et al. (4). Though pathognomonic for the HIV infection and commonly observed in adult HIV+ patients, this is considered rare in children (16). In this study the diagnosis of the oral manifestations was carried out according to the criteria for presumable diagnosis based on clinical characteristics (2), which in the case of hairy leukoplakia constitutes a limitation for a definitive diagnosis (3).

The frequency of gingivitis was quite high in this sample (18%), compared with 3% observed in Moniaci et al. (12). Nonetheless, Valdez et al. (8) and Howell et al. (1) report the presence of gingivitis in over 40% of the children they examined. Of the 18 patients with candidiasis, nine (50%) presented gingivitis, thus suggesting a relationship between them. Gingivitis is associated to local plaque accumulation and manifests itself both in patients with and without immunosuppression. Microbiological studies of plaque revealed the presence of *Actinobacillus actinomycetemcomitans* and *Candida albicans* in the lesions of linear gingival erythema and necrotic ulcerative periodontitis (11) and

gingivitis associated with HIV (17).

The fact that the average CD4 percentage was low for children with gingivitis and most of them had serious immunosuppression may also be explained by negligence on the part of those responsible for oral hygiene. More lesions are present in the oral cavity in more immunologically compromised patients. This can make it painful to brush their teeth. As long as brushing is the method of hygiene used by most patients at the IPPMG clinic, those responsible tend not to submit the children to yet another "sacrifice". The relationship between low CD4 and the presence of conventional gingivitis has also been observed by Howell et al. (1). However, Vieira et al. (18) found no connection between suppression of the immune system and gingivitis.

According to Pahwa et al., quoted by Chigurupati et al. (19), hypertrophy of the parotid (uni or bilateral) is identified among 10 to 30% of symptomatic patients. It is a chronic manifestation that requires no treatment. Xerostomia may or not be associated with these cases (1). This manifestation seems to be related to a slower progression of the disease caused by the HIV virus (15). In this study, only two (28.6%) of the 7 children suffering from hypertrophy of the parotid had serious immunosuppression, the others had moderate or no immunosuppression. When compared to candidiasis, the patients with hypertrophy of the parotid were immunologically far less compromised (higher percentage of CD4), in agreement with the findings of Fonseca et al. (20). Katz et al. (15) reports that the average survival for patients with candidiasis is 3.4 years, whereas for those with parotid hypertrophy, this average climbs to 5.4 years. This may mean a better prognosis for the HIV infection when this manifestation is present. Further studies are necessary to elucidate this question.

According to Chigurupati et al. (19), the lesions caused by herpes simplex in HIV-positive children assume chronic and recurrent characteristics and may progress rapidly to extensive mucocutaneous involvement. Examining 53 HIV+ children at the IPPMG - UFRJ Pediatric AIDS Outpatients Clinic, Teles (9) reported a prevalence of 2.1% for herpes simplex, similar to this study (only one case, 1.3%).

We conclude that oral manifestations are common in children infected by HIV and are directly related to the degree of immunosuppression. Such lesions may be considered as indicative of the progression of HIV infection in children.

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RESUMO

dos Santos LC, Castro GF, de Souza IPR, Oliveira RHS. Relação entre grau de imunossupressão e manifestações bucais em crianças HIV+. *Braz Dent J* 2001;12(2):135-138.

Manifestações bucais são freqüentemente observadas em crianças infectadas pelo HIV e muitas vezes são os primeiros sinais clínicos da infecção. O objetivo deste artigo foi relatar a prevalência de manifestações bucais em tecidos moles e sua relação com o grau de imunossupressão em 80 crianças infectadas pelo HIV (média de idade $6,30 \pm 3,32$ anos), pacientes do IPPMG - UFRJ, todas com diagnóstico definitivo para a infecção. Trinta crianças (38%) apresentavam algum tipo de lesão e o percentual de CD4 das mesmas era menor do que o encontrado nas crianças sem lesão ($p < 0,05$); 22,5% das crianças apresentavam candidíase, 17,5% gengivite, 8,8% hipertrofia de parótidas, 1,3% herpes simples e 1,3% leucoplasia pilosa. Das 30 crianças com lesão, 70,0% estavam com imunossupressão grave, 23,3% com imunossupressão moderada e apenas 6,7% com imunossupressão ausente. As manifestações bucais estão diretamente relacionadas com o grau de imunossupressão e tais lesões podem ser consideradas como indicadores da progressão da infecção pelo HIV em crianças.

Unitermos: síndrome da imunodeficiência humana, infecção pelo HIV, crianças, manifestações bucais, imunossupressão.

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